

BS8233 & BS4142 ASSESSMENT

OF 26 KING STREET,

GRAVESEND,

DA12 2DU

19th February 2026

Prepared by:

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1.0 Introduction

- 1.01 E2 Consultants have been commissioned to undertake a noise impact survey and assessment for a new development at 26 Kings Street, Gravesend, DA12 2DU.
- 1.02 The methodology used for this assessment will be BS8233 as this is a new development within the designated area. BS4142:2014 will then be used for industrial noise assessments with BB93 also considered for the nursery and potentially educational aspects of the building.
- 1.03 The report will also issue recommendations of acoustic performance of glazing and, if required, ventilation proposals in order for the future dwelling to meet all necessary criteria. Any mitigation measures required will also be listed within this report.

2.0 Development Description

- 2.0.1 The proposed development is in a building between King Street and Windmill Street in the heart of Gravesend.
- 2.0.2 The development lies in a mixed residential and retail area with some pubs/bars and restaurants also in the immediate vicinity of the proposed location.
- 2.0.3 The building is to be converted into a performing arts studio in the building to the rear with after-school clubs/nursery areas in rooms around the main studio. The front of the building is proposed to hold a café over the ground floor and first floor areas. The main concern is the break-out noise from the performing arts studio as well as the potential noise impact from the introduction of any noise-generating industrial products that may be used for ventilation purposes or in the kitchen area. This report is therefore looking at both the break-out noise from the main studio but also the break-in noise from any external noise sources to the after-school club areas.
- 2.0.4 With the above sources in mind the monitoring took place at the front of the building to ascertain the current noise impact on the adjacent hotel buildings, residential first-floor flats opposite and also any surrounding businesses to the front that may be impacted by adverse noise levels. A second sound level meter was setup in the courtyard area in the centre to obtain both shielded background noise for the residential areas at the rear, but also to collect any potential data on industrial noise sources that may impact the after-school club areas. This was particularly in relation to 'The Goose' pub located next door which may have had extraction/condenser unit noise to the rear.

2.1 Locations of Monitors

- 2.1.1 Two Type 1 sound level meters were installed. One approximately 3m on a lamppost directly to the front of the building, and the rear/courtyard assessment conducted on a tripod at approximately 1.7m.
- 2.1.2 Figure 1 & 2 shows the area where the monitors were installed.
- 2.1.3 All location is displayed on site map in figure 3

Figure 1 – Kings Street Lamppost



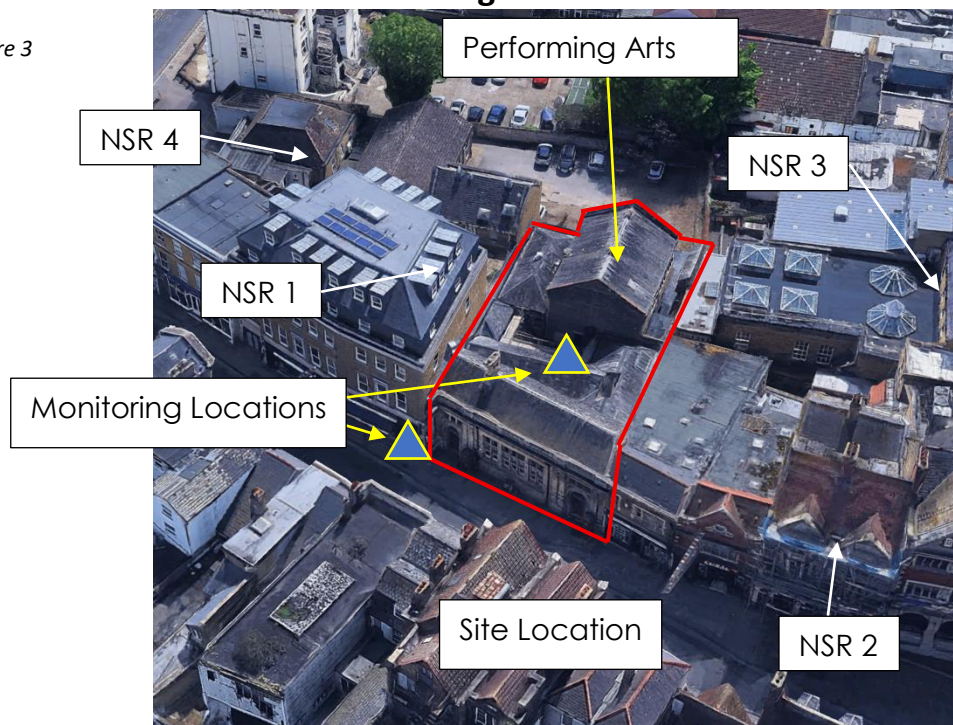
Figure 2 – Courtyard Area



- 2.1.4 Measurements were made in 15 minute periods, on 1 second averaging, to allow for the removal of anomalies and increased accuracy. The data was averaged into $L_{Aeq16hr}$ daytime and L_{Aeq8hr} night-time with data also recorded for L_{Amax} in both day and night periods for the BS8233:2014 assessment. Data was also collected for L_{Aeq_1hr} and L_{A90} for the BS4142:2014 aspect of the assessment.
- 2.1.5 The monitoring was conducted using 2 x Type 1 NTi XL3 sound level meters, outdoor case with batteries and outdoor microphone protection.
- 2.1.6 The measurements were taken by a fully qualified engineer with AMIOA status with the institute of Acoustics.
- 2.1.7 All measurements were taken after a field calibration was undertaken to ensure accuracy and repeatability of measurements. Drift was checked post-measurement to validate the data collected.
- 2.1.8 Further data such as wind speed, wind direction, rainfall intensity, temperature and cloud cover were all recorded at the beginning and end of the assessment at the monitoring location.
- 2.1.9 Any anomalies (such as noise by the engineer during setup and collection of the kit) were removed from the survey for a true reflection of the ambient levels in the vicinity. This was done by recording audio throughout the survey at each location and listening back through the files during the analysis process to confirm what was recorded manually during the survey.
- 2.1.10 Care was taken to inform any residents in the area that audio recording was taking place.

2.2 Plan Views of Site with Designated Work Areas

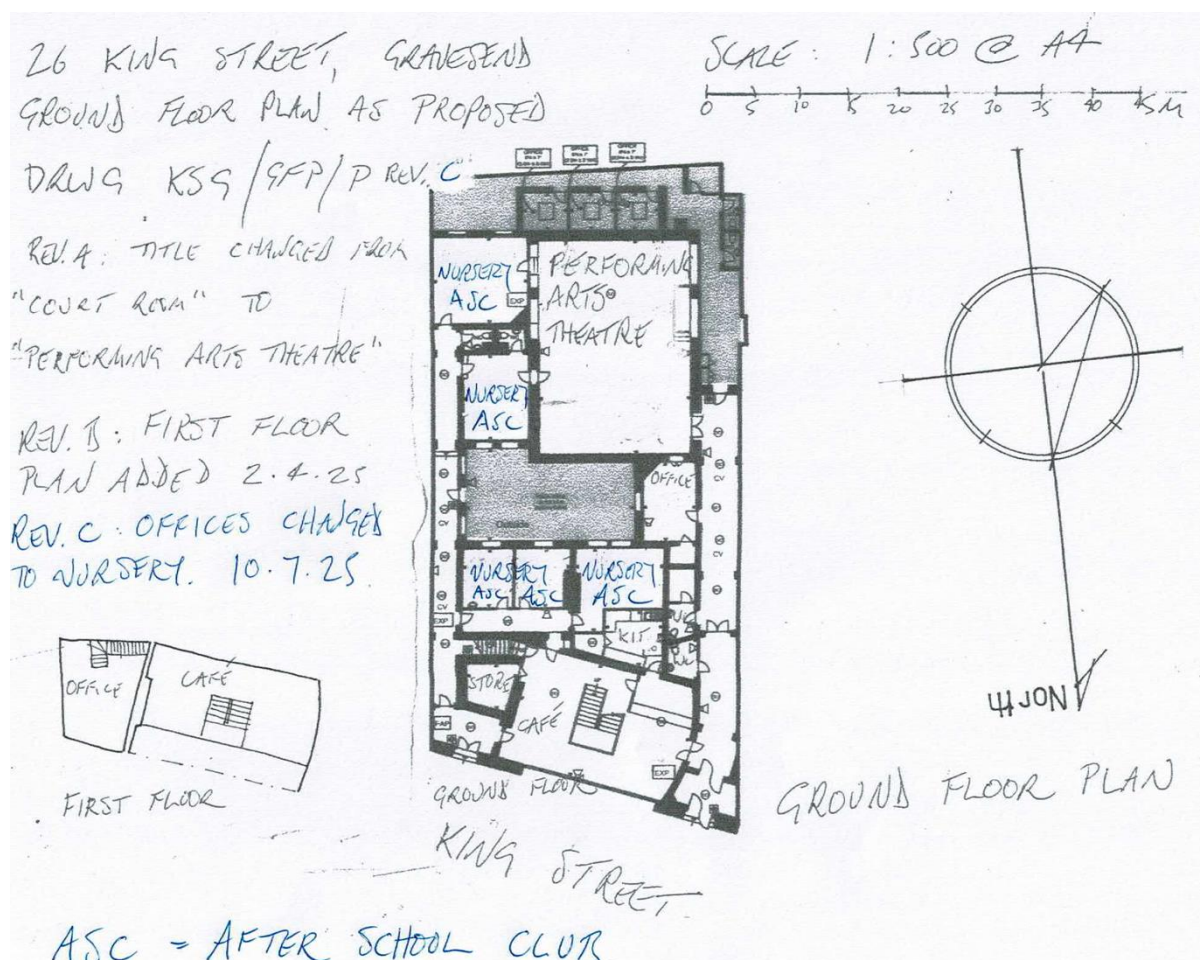
Figure 3



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2.3 Proposed Site Layout (example floor)

Figure 4



3.0 Noise Assessment Criteria

3.0.1 The National Planning Policy Framework (NPPF) sets out the Government's economic, environmental and social planning policies for England and "these policies articulate the Government's vision of sustainable development." In respect of noise, Paragraph 174 of the NPPF states the following:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability."

Paragraph 185 goes on to mention:

“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;”

3.0.2 The NPPF reinforces the March 2010 DEFRA publication, “Noise Policy Statement for England” (NPSE), which states three policy aims, as follows:

“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life;
- and where possible, contribute to the improvement of health and quality of life.”

3.0.3 Together, the first two aims require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

“... all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.”

3.0.4. It is possible to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

- The effect may be determined by reference to guideline noise values. British Standard (BS) 8233:2014 and World Health Organisation (WHO) “Guidelines for Community Noise” contain such guidelines.
- Another method is to compare the resultant noise level against the background noise level (LA90) of the area. This is the method employed by BS 4142:2014 to determine the likelihood of complaint from noise of an industrial nature. It is best suited to the assessment of steady or pseudo-steady noise.

3.0.5 British Standard 8233:2014 is principally intended to assist in the design of new dwellings; however, the Standard does state that it may be used in the assessment of noise from new sources being brought to existing dwellings.

3.0.6 The WHO guideline values are appropriate to what are termed “critical health effects”. This means that the limits are at the lowest noise level that would result in any psychological or physiological effect.

The WHO/BS 8233 guideline noise values are summarised in the following table:

Table 1

Guidance Document	L _{AeqT}	L _{AMax}	Outcome
World Health Organisation “Community Noise 2000”	55dB		Serious annoyance, daytime and evening. (Continuous noise, outdoor living areas)
	50dB		Moderate annoyance, daytime and evening. (Continuous noise, outdoor living areas).
	35dB		Moderate annoyance, daytime and evening. (Continuous noise, dwellings, indoors)
	30dB		Sleep disturbance, night-time (indoors)
		60dB	Sleep disturbance, windows open at night. (Noise peaks outside bedrooms, external level).
		45dB	Sleep disturbance at night (Noise peaks inside bedrooms, internal level)
BS 8233:2014 “Sound Insulation and noise reduction for buildings”	55dB		Upper limit for external steady noise. (gardens and patios).
	50dB		Desirable limit for external steady noise. (gardens and patios).
	L _{Aeq} 16 hours = 35 dB		Resting, living room day. (Internal – steady noise)
	L _{Aeq} 16 hours = 40 dB		Dining, dining room day. (Internal – steady noise)
	L _{Aeq} 16 hour = 35 dB		Sleeping, bedroom day (Internal – steady noise)

	L _{Aeq} 8 hours = 30 dB		Sleeping, bedroom day (Internal – steady noise)
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3.0.7 For L_{AeqT} criteria the time base (T) given in the documents is 16 hours for daytime limits and 8 hours for night time limits. All surveys are conducted on 1 hour daytime and 15 minute night values – based on 1 second readings on a Type 1 sound level meter. The readings are taken every 5 mins for noise to allow the elimination of erroneous data if required.

3.0.8 The WHO guidelines are also concerned with the L_{AMax} for night-time sleep disturbance. The guideline states:

“For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{AFmax} more than 10-15 times per night”

3.0.9 On this basis, for the purpose of assessing night-time L_{AFmax} noise events, it is considered appropriate to adopt the 10th highest L_{AFmax} noise event occurring in a typical night-time (23:00 – 07:00) period.

3.0.10 Audio recordings are taken throughout the measurements to allow for further assessments on high levels. Listening to the audio and performing tonal analysis will allow anomalies to be removed from the data, if required.

3.1 Building Bulletin 93 – February 2015

3.1.1 According to the building regulations requirement E4 from part E of schedule 1:

“Each room or other space in a school building shall be designed and constructed in such a way that it has the acoustic conditions and the insulation against disturbance by noise appropriate to its intended use.”

3.1.2 This statement is echoed by the School Premises Regulations and Independent School Standards.

3.1.3 BB93 refers to the acoustics in conversions/new builds as follows:

The School Premises Regulations and the Independent School Standards apply to refurbishment work, and the acoustic standards for refurbishment works given in this document apply. Where there is a need to upgrade the acoustic performance of an existing building or when refurbishment is undertaken for other reasons, then the refurbished elements should meet, as far as reasonably practicable, the acoustic performance given in these guidelines to satisfy the School Premises Regulations, the Independent School Standards and the Equality Act. Although Building Regulations do not apply to all alteration and refurbishment work, it is desirable that such work should consider acoustics and incorporate upgrading of the acoustics as appropriate. In addition, Regulation 4 of the Building Regulations requires that any building work on an existing

school should not make an existing requirement or contravention any worse than before building work was carried out. In the case of existing buildings, Part E of the Building Regulations applies to material changes of use as defined in Building Regulations. The tables in section 1 give recommended values for both new buildings and for refurbished elements. Where there is a material change of use as defined in the Building Regulations, such work should be carried out as is necessary to ensure that the building complies with Requirement E4 of the Building Regulations. In these cases, the 'refurbishment' criteria contained within this document apply. The School Premises Regulations and Independent School Standards apply whether or not there is a material change of use. 0.3.3.1. Material changes of use The Building Regulations apply to certain changes of use of an existing building known as 'material changes of use'.

The meaning of material change of use is given in Regulation 5 of the consolidated Building Regulations. For schools the most common material changes of use that are listed in Regulation 5 will be: "5.(e) any building used as a public building, where previously it was not; and... A "public building" is defined as a building consisting of or containing— (b) a school or other educational establishment ..." The Requirements of the Building Regulations relating to material change of use are given in Regulation 6.-(1): "6.-(1) Where there is a material change of use of the whole of a building, such work, if any, shall be carried out as is necessary to ensure that the building complies with the applicable requirements of the following paragraphs of Schedule

- 3.1.4 In addition to the above, there is an emphasis on the acoustics of objects within the classrooms themselves. These sounds are referred to as 'operational noise'. This would be conducted within the final acoustic testing of the finished building to make sure that each class area is compliant with the relevant section. These internal noise sources provide some of the makeup of the Indoor Ambient Noise Level (IANL) along with the break-in noise from exterior sources such as road and rail.

- 3.1.5 *"The IANL excludes noise contributions from:*

- teaching activities within the school premises, including noise from staff, students and equipment within the building or in the playground (noise transmitted from adjacent spaces is addressed by the airborne and impact sound insulation requirements)*
- equipment used in the space (eg machine tools, CadCam machines, dust and fume extract equipment, compressors, computers, projectors, fume cupboards) as these noise sources are considered as operational noise, see 0.3.8*
- rain noise – however, Building Regulation submissions should demonstrate that lightweight roofs and roof glazing have been designed to provide suitable control of rain noise reverberant sound pressure level in a space (calculated using laboratory test data with 'heavy' rain noise excitation as defined in BS EN ISO 140-18[Ref.13]). Levels during heavy rain should not be more than 25 dB above the appropriate indoor ambient noise level given in table 1 (for refurbishments, this applies only to new roofing elements and not to repairs to existing roofs)".*

- 3.1.6 Table 2 below provides the sensitivity levels for indoor spaces based on the IANL from BB93:

Table 2

Type of room	Room classification for the purpose of airborne sound insulation in Tables 3a and 3b		Upper limit for the indoor ambient noise level <i>L</i> _{Aeq,30mins} dB	
	Activity noise (Source room)	Noise tolerance (Receiving room)	New build	Refurbishment
Nursery school rooms <i>Primary school:</i> classroom, class base, general teaching area, small group room <i>Secondary school:</i> classroom, general teaching area, seminar room, tutorial room, language laboratory	Average	Medium	35	40
<i>Open plan: (See also section 1.8)</i> Teaching area Resource/breakout area	Average	Medium	40	45
Primary music room	High	Medium	35	40
Secondary music classroom ¹ Small and large practice/group room ¹ Performance/recital room ¹	Very high	Low	35	40
Ensemble room ¹ Recording studio ¹	Very high	Low	30	35
Control room - for recording ¹ Control room - not for recording	High Average	Low Medium	35	40
Lecture room	Average	Medium	35	40
Teaching space intended specifically for students with special hearing and communication needs ²	Average	Low	30	35
SEN calming room	High	Low	35	35

Type of room	Room classification for the purpose of airborne sound insulation in Tables 3a and 3b		Upper limit for the indoor ambient noise level <i>L</i> _{Aeq,30mins} dB	
	Activity noise (Source room)	Noise tolerance (Receiving room)	New build	Refurbishment
<i>Administration and ancillary spaces:</i> Kitchen Office, medical room, staff room Corridor, stairwell, coats and locker area Changing area Toilet	High Low Average High Average	High Medium High High High	50 40 45 50 50	55 45 55 55 55

Type of room	Room classification for the purpose of airborne sound insulation in Tables 3a and 3b		Upper limit for the indoor ambient noise level $L_{Aeq,30mins}$ dB	
	Activity noise (Source room)	Noise tolerance (Receiving room)	New build	Refurbishment
Study room (individual study, withdrawal, remedial work, teacher preparation)	Low	Medium	40	45
<i>Libraries:</i> Quiet study area	Low	Medium	40	45
Resource area	Average	Medium	40	45
Science laboratory	Average	Medium	40	45
<i>Design and technology:</i> Resistant materials, CAD/CAM area	High	High	40	45
Electronics/control, textiles, food, graphics, design/resource area, ICT room, art	Average	Medium	40	45
Drama studio, assembly hall, multi-purpose hall (drama, PE, audio/visual presentations, assembly, occasional music)	High	Low	35	40
Atrium, circulation space not intended for teaching and learning	Average	Medium	45	50
Sports hall Dance studio Gymnasium/Activity studio	High	Medium	40	45
Swimming pool	High	High	50	55
Meeting room, Interviewing/counselling room, video conference room	Low	Medium	40	45
Dining room	High	High	45	50

3.1.6 *“Notes 1 Music rooms – the levels of sound insulation between some music rooms may not be sufficient for particularly noisy activities and timetabling/management will need to be considered. Wherever possible music accommodation should make use of buffer spaces such as stores to increase the levels of sound insulation between rooms and to isolate rooms where very noisy activities such as drum practice will take place. If timetabling/management or isolation is not possible the levels of sound insulation should be increased. For further guidance on the design of music accommodation see ‘Music Accommodation in Secondary Schools: a Design Guide’, DfE, NBS/RIBA, 2010 Ref.12 and ‘Acoustics of Schools: a design guide’ Ref.1 2*

3.1.7 *APs are commonly required for these rooms and should be agreed by an acoustician and the school client body. See section 0.4. In order to protect students from regular discrete noise events, eg, aircraft or trains, indoor ambient noise levels should not exceed 60 dB LA1,*

30mins. This is achieved by default for spaces with IANLs up to 40 dB LAeq, 30min, but requires assessment in spaces with higher IANL limits, eg, 45 and 50 dB."

- 3.1.8 *"Noise levels in unoccupied playgrounds, playing fields and other outdoor areas should not exceed 55 dB LAeq,30min and there should be at least one area suitable for outdoor teaching activities where noise levels are below 50 dB LAeq,30min. If this is not possible, due to a lack of suitably quiet sites, acoustic screening should be used to reduce noise levels in these areas as much as practicable, and an assessment of noise levels and options for reducing these should be carried out. Noise levels can be reduced by up to 10 dBA at positions near an acoustic screen."*

3.2 BS4142:2014 +A1 (2019)

- 3.2.1 Noise effects on residential properties have been assessed according to the guidance in BS 4142:2014. This standard primarily provides a numerical method by which to determine the significance of sound of an industrial nature (i.e. the 'specific sound' from the proposed development) at residential sensitive receptors.
- 3.2.2 The specific sound level may then be corrected for the character of the sound (e.g. perceptibility of tones and/or impulses), if appropriate, and it is then termed the 'rating level', whether or not a rating penalty is applied. The 'residual sound' is defined as the ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
- 3.2.3 According to BS 4142:2014, the background sound levels adopted for the assessment should be representative of the periods being assessed. The standard recommends that the background sound level should be collected from continuous measurements of normally not less than 15-minute intervals. However, the Standard states that there is no 'single' background sound level that can be derived from such measurements. It is particularly difficult to determine what is 'representative' of the night-time period because it can be subject to a wide variation in background sound levels between the shoulder night periods.
- 3.2.4 The method chosen for this section of the report is to use the data collected at the nearest NSR for the day and night periods to provide the ambient and background noise levels. The mode $L_{Aeq_1hr(Day)}$ and $L_{Aeq_15min(Night)}$ value will then be used for each time period over the course of the measurement as the most appropriate way of creating a representative value.
- 3.2.5 The specific sound levels have been determined separately in terms of the L_{Aeq1hr} during the daytime $L_{Aeq15min}$ during the night-time. Daytime is typically between 07:00 and 23:00 hours and night-time is typically between 23:00 and 07:00 hours, so these periods have been adopted for this assessment.

3.2.6 At each of the most likely sensitive receptor locations, the rating level has been determined from the predicted specific sound level. Where it has considered it to be appropriate, a rating penalty has been applied for tonality, impulsivity and/or intermittent specific sounds as described in the commentary to paragraph 9.2 of BS4142:2014. This has been applied with consideration for the main sound sources from site that contribute to the level of specific sound at the receptor location.

3.2.7 As per the requirements of the standard, an initial estimate of the impact of the specific sound has been obtained by subtracting the measured background sound level from the rating level of the specific sound. Table 2 provides the initial evaluation of impact following this method.

Table 1

Magnitude	Difference Between rating Level and Background Level	Comments
High	+10dB	Significant Adverse impact Likely
Medium	+5 to +10dB	Adverse impact Likely
Low	0 to +5 dB	Low Chance of Adverse Impact
Negligible	Less than 0dB	Low Chance of Adverse Impact
No Change	-10 dB	No adverse impact

3.2.8 Following the initial evaluation of impact, the context of the sound has also been considered, which is a key requirement of the Standard. In evaluation of the context, the following factors have been considered:

- the absolute level of the sound;
- the character and level of the residual sound compared to the character and level of the specific sound and
- the sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

4.0 Results

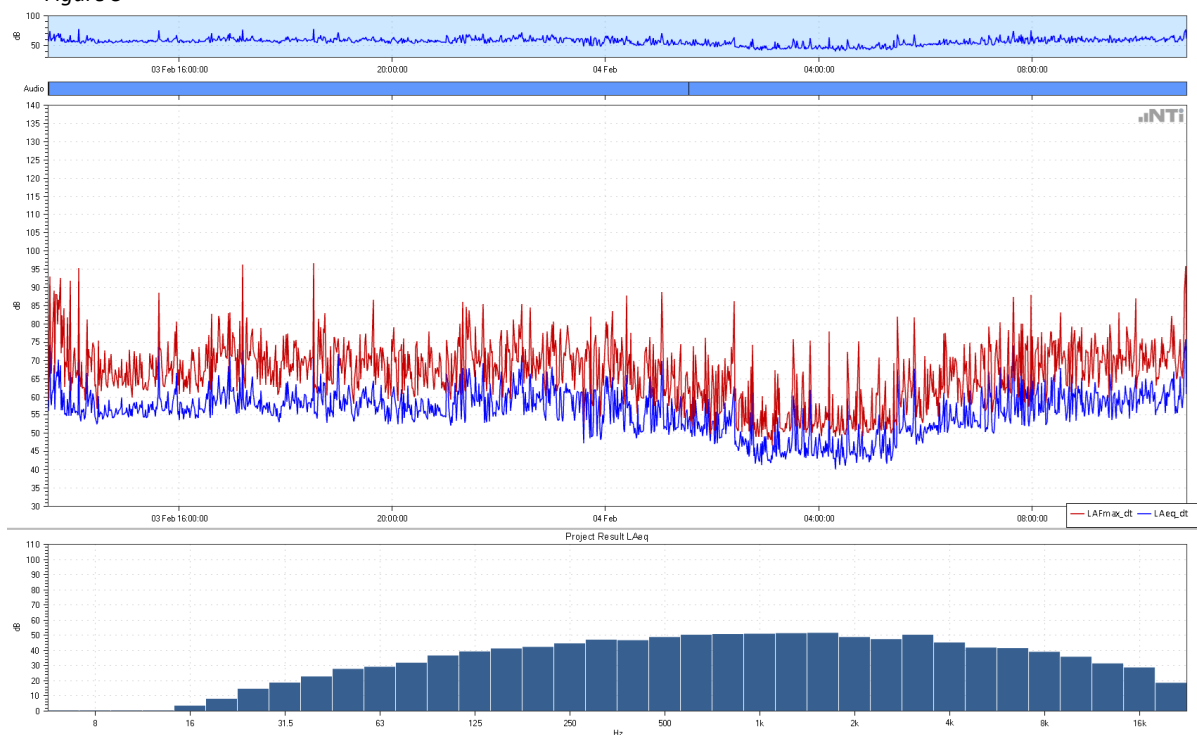
4.1 Front/Kings Street Lamppost – 13.33pm 03/02/26 – 10.53am 04/02/26

Table 2

Time Period	L _{Aeq_1hr}	L _{Aeq_16hr}	L _{Aeq_15mins}	L _{Aeq_8hr}	L _{Amax} (10th highest)	L _{A90}
Day	60.6dBA	60.9dBA				52.3dBA
Night			51.5dBA	54.2dBA	79.6dBA	40.4dBA

4.1.1 Comments: Mainly patron pass-by noise. Some traffic noise from the surrounding road network.

Figure 5



Day/Time	Cloud Cover	Temperature (Celcius)	Presence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
Installation	2	9	No	0.3	NW
Collection	5	7	No	1.4	W

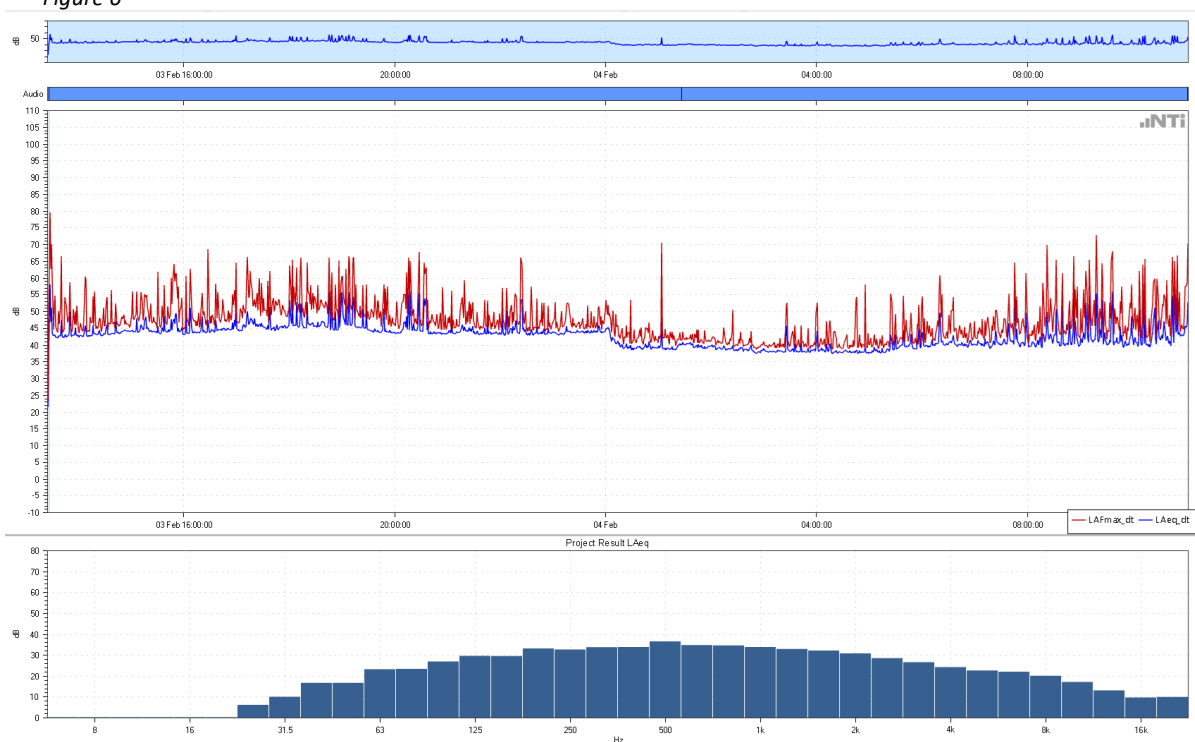
4.2 Rear/Courtyard Area – 13.26pm 03/02/26 – 11.02am 04/02/26

Table 3

Time Period	L _{Aeq_1hr}	L _{Aeq_16hr}	L _{Aeq_15mins}	L _{Aeq_8hr}	L _{Amax} (10th highest)	L _{A90}
Day	45.3dBA	45.6dBA				43.1dBA
Night			39.4dBA	40.1dBA	53.3dBA	37.4dBA

4.2.1 Comments: Some traffic noise. Low-level ambient noise fairly consistent.

Figure 6



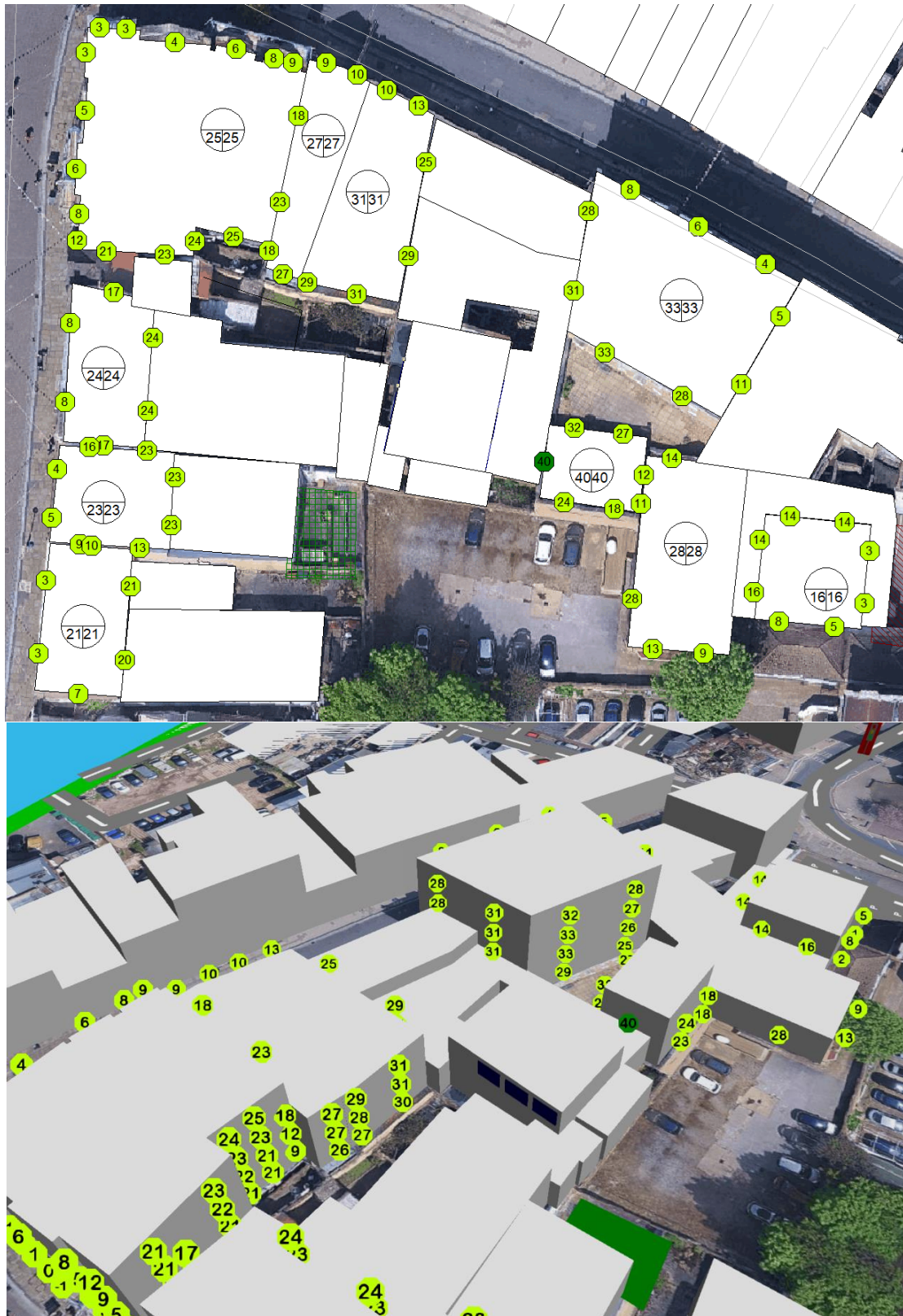
Day/Time	Cloud Cover	Temperature (Celcius)	Presence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
Installation	2	7	No	0.1	NW
Collection	5	5	No	0.2	W

5.0 Noise Mapping of New Studio Area

- 5.0.1 The results from section 4 have been used to map the noise climate of the area using the CadnaA noise modelling software. This takes into account ground attenuation through absorption, contours for the area, reflections and distance variations for the various sources. It also calculates the shielding of surrounding buildings etc in the area.
- 5.0.2 The software has also been used to model the noise break-out from the proposed performing arts studio. As there is likely to be amplified music from the area this is expected to be the most likely cause of any adverse impact on the surrounding properties.
- 5.0.3 As the glazing around that aspect of the building is going to be the weak points the masonry areas of the building have been somewhat disregarded for noise breakout. Any sound transfer through the masonry will be minor compared to the glazing areas of the building.
- 5.0.4 Based on previous assessments and worst-case scenarios from other similar acoustic reports, the performing arts studio speaker system is expected to produce a maximum $L_{Aeq,t}$ value of 85dBA at 1m from the speakers. As the existing speaker system is being proposed to be used for the studio it has been estimated that they are 5W speakers around the room, with one in each corner. Using the volume of the room and the estimated absorption coefficient of 0.3 (for a largely reverberant room with some soft furnishings and drapes expected to be used when the studio is in full operation), the caculated internal reverberant sound pressure level is 91dBA. In reality it is unlikely to reach this level but this is seen as the worst-case scenario and used to produce a robust outcome on potential noise impact. This has been inputted into the CadnaA modelling software.
- 5.0.5 Figure 8 shows the expected noise impact from the breakout noise emanating from the proposed performing arts studio. Figure 8 shows the noise levels based on the window areas being open holes and figure 9 shows the noise impact with the introduction of double-glazed windows (Rw29).

Figure 8 – Daytime noise impact from proposed performning arts studio (with windows as open gaps)

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5.1.1 Comparison of Results to BS4142:2014

- 5.1.1 Table 6 provides the noise impact on the closest NSR (Noise Sensitive Receptor) locations as indicated in figure 3 above.

Table 6

Location	Measured L_{Aeq_t}	Representative L_{A90} (Daytime)	Representative L_{A90} (Night)	Predicted Noise Impact (no attenuation)	Predicted Noise Impact (Rw 29 Double- glazing)	Difference to Background (With/without Glazing Spec)	Difference to Background (Night)
NSR 1 (Rooms above Goose)	61dBA	52dBA	40dBA	62dBA	33dBA	(+10dB/-19dB)	-7dB
NSR2 (27/28 King Street)	45dBA	43dBA	37dBA	56dBA	27dBA	(+11/-16)	-10dB
NSR3 (2 Windmill St)	45dBA	43dBA	37dBA	53dBA	24dBA	(+8/-19)	-13dB
NSR4 (193 Parrock Street)	45dBA	43dBA	37dBA	45dBA	16dBA	(+2/-29)	-21dB

- 5.1.2 The Noise impact levels with no attenuation (if the windows were open holes) would be between 2-11dBA above the background noise levels and produce an adverse impact on the surrounding NSR locations. With the addition of double-glazing, Rw 29 (using Pilkington 4mm/(4-16mm)/4mm double-glazing product) would then be 16-29dBA below the background noise level and return a value of no adverse impact on the surrounding NSRs. The night-time levels are also significantly below the measured background noise levels at each NSR location.
- 5.1.3 The large difference between the background noise levels and the predicted impact levels from the performing arts studio also provides a large contingency area should noise levels be higher or the studio needs to introduce openable windows.
- 5.1.4 BS8233:2014 says that openable windows produce a maximum noise attenuation of 15dBA. Figure 10 shows the area if all windows are open, speakers all at the 85dBA at 1m and an assumed attenuation of 15dB for newly installed windows is used.
- 5.1.5 The modelled values are then shown in results table 7 to examine the noise impact on the surrounding NSRs.

Figure 10 – Daytime noise impact from proposed performing arts studio (with windows open and assumed 15dB attenuation)

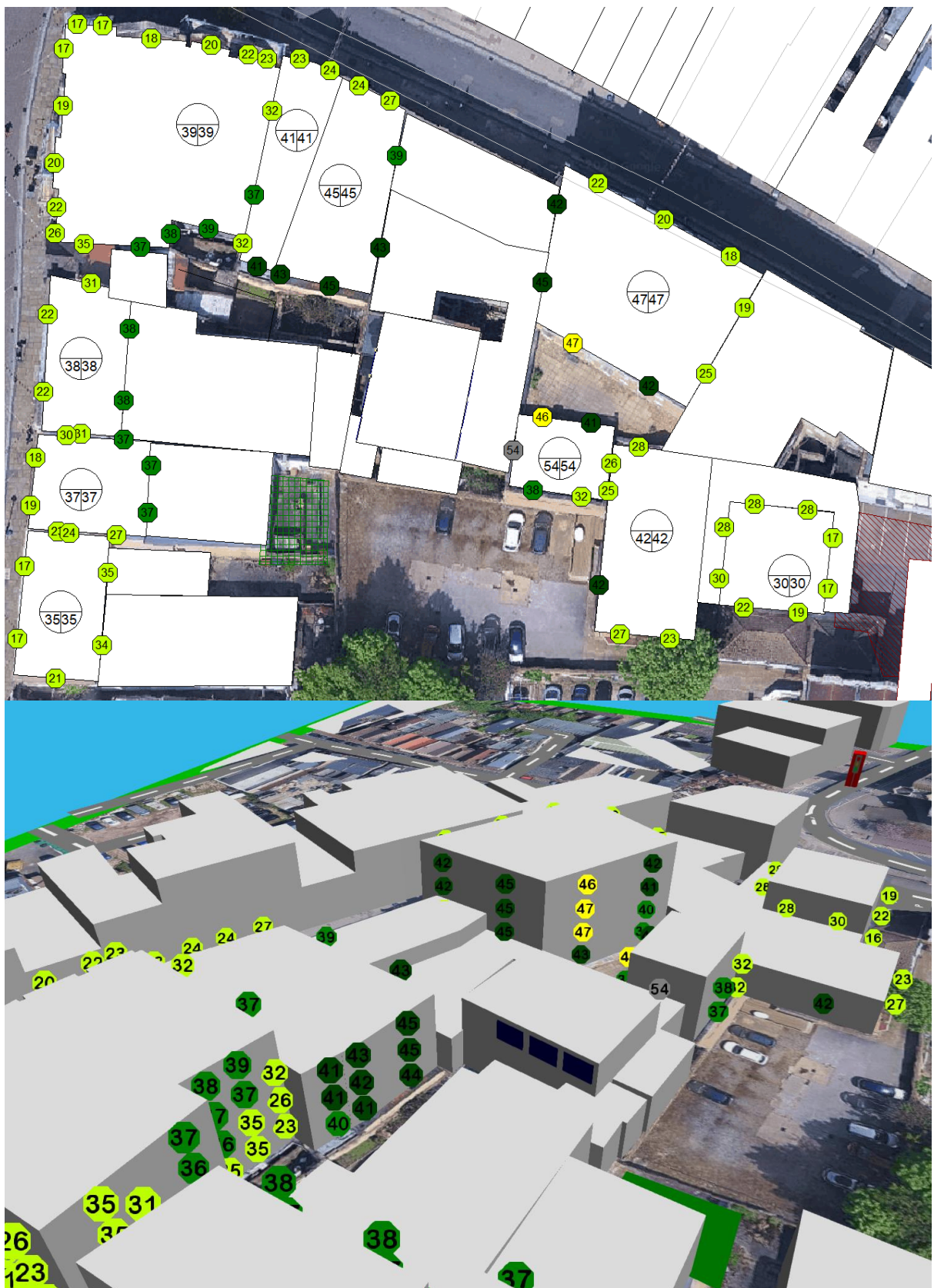


Table 7

Location	Measured L _{Aeq,t}	Representative L _{A90} (Daytime)	Representative L _{A90} (Night)	Predicted Noise Impact (Windows Open)	Difference to Background (Daytime)	Difference to Background (Night-time)
NSR 1 (Rooms above Goose)	61dBA	52dBA	40dBA	47dBA	-5dB	+7dB
NSR2 (27/28 King Street)	45dBA	43dBA	37dBA	41dBA	-2dB	+4dB
NSR3 (2 Windmill St)	45dBA	43dBA	37dBA	38dBA	-5dB	+1dB
NSR4 (193 Parrock Street)	45dBA	43dBA	37dBA	30dBA	-13dB	-7dB

- 5.1.6 Table 7 shows that the studio would be able to have the windows open with there only being a low chance of adverse impact on the surrounding NSR locations during the daytime period. This is because the noise impact ranges from 2-13dB below the background noise levels.
- 5.1.7 As the Studio is requesting to be open into the night-time hours (after 11pm) this has also been considered. Table 7 shows that the night-time period would exceed the noise levels at NSR 1, 2 and 3. NSR 2 and 3 would be rated as a 'low chance of adverse impact' but NSR would be rated as 'Adverse impact likely' in accordance with BS4142:2014. Therefore the windows cannot be opened during any periods of elevated music within the performing arts studio.

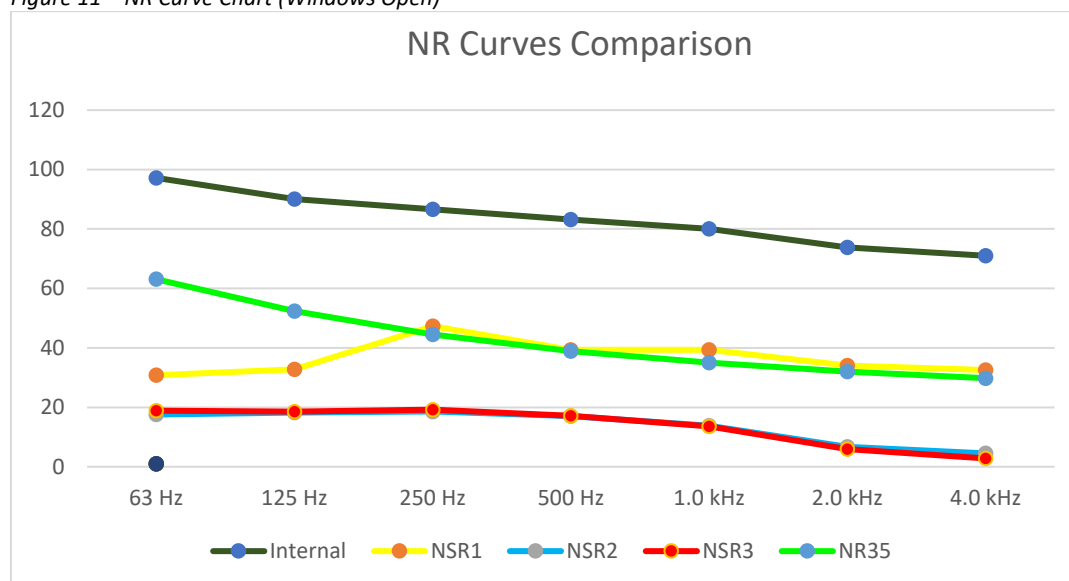
5.2 NR Calculations

- 5.2.1 The calculations made in section 5 were based on the specification shown within section 6. These figures have been used based on the requirement for entertainment type noise is for the levels to be controlled to less than NR 20 inside habitable rooms of nearby receptors during the daytime. If open windows are still being accounted for this would be an external value of NR35. If this policy is used in respect of table 7 it would mean that NSR1 would exceed this value if all of the windows for the studio were open during performances. However, the higher background noise levels at these locations would mean that all 4 of these NSR locations would already be in excess of the NR35 limit. Table 8 and figure 11 below show the internal value and then the impact values at each NSR in 1/1 octave bands.

Table 8 – NR Comparison table (Windows of Studio Open)

1/1 Octave dB values							
	63 Hz	125 Hz	250 Hz	500 Hz	1.0 kHz	2.0 kHz	4.0 kHz
Internal	97.2	90.1	86.6	83.2	80	73.8	71
NSR1	30.8	32.8	47.3	39.3	39.3	34.1	32.6
NSR2	17.6	18.2	18.6	17	13.8	6.7	4.5
NSR3	18.9	18.6	19.2	17.2	13.6	5.9	2.8
NSR4	23.8	24.5	26.6	26.2	23.3	15.3	10.8
NR35	63.1	52.4	44.5	38.9	35	32	29.8

Figure 11 – NR Curve Chart (Windows Open)



- 5.2.2 Figure 11 shows that the NSR 1 locaiton is NR36 so would exceed the internal noise level of NR 20 required for entertainment noise.
- 5.2.3 If the comparison is made to closed windows all NR values are significantly below the NR35 requirement and therefore within criteria. This means that windows on the East boundary of the performing arts studio in particular should not be open during the playing of elevated music levels. The west boundary could have windows open but it would be safer to say that all windows must remain closed when the studio is in use with elevated music levels being played.
- 5.2.4 The windows of the performing arts studio would also not recommended to be open during use as there would be a background noise 'creep' at NSR1, 2 and 3. NSR 4 would have no impact on the background noise level. NSR1 would increase by 1dB, NSR 2 would increase by 2dB and NSR3 would also increase by 1dB based ontheh predicted and measured levels. This background noise creep is against the majority of local councils' policies so that there is not a continuous increase in background noise levels that may in turn increase adverse impact on the residents of built-up areas.

6.0 Glazing, Structural and Ventilation Recommendations

- 6.0.1 This section shows the recommendations for the windows and glazing to prevent both noise breakout to the surrounding NSRs and also noise break in to any of the after-school club areas. It is recommended that the same specification of glazing and ventilation is used throughout the property where existing units are deemed to be in need of replacing.

6.1 External Walls

- 6.1.1 External walls of the proposed building are assumed to be equivalent or better in performance to traditional 9" brick.

Table 9

Description	Octave Band Centre Frequency (Hz) Sound Reduction Index <i>R</i> dB					
	125	250	500	1k	2k	4k
Traditional solid 9" brick & block with ties	47	49	49	58	68	79

6.2 Glazing

- 6.2.1 Suitable sound insulation performance of all windows and patio doors of the development may be achieved with standard double-glazing type 4-airgap-4, typically $\geq R_w 29$ dB. An example product for noise reduction is shown in table 10.

Table 10

Description	Octave Band Centre Frequency (Hz) Sound Reduction Index <i>R</i> dB						<i>R_w</i> (C; Ctr)
	125	250	500	1k	2k	4k	
Pilkington 4 mm / (6-16 mm argon) / 4 mm	21	17	25	35	37	31	29 (-1,-4)

6.3 Ventilation

- 6.3.1 It is anticipated that a ventilation system will be needed to be incorporated into the scheme design, such that users of the property are able to have background ventilation without necessarily needing to open windows. Table 11 provides an example product that any vents or mechanical ventilation should meet the specification of.

Table 11

Description	Octave Band Centre Frequency (Hz) Sound Reduction Index <i>D_{n,e}</i> dB					
	125	250	500	1k	2k	4k
Standard non-acoustic trickle ventilator typically $\geq D_{n,e,w}$ 30dB	30	30	30	30	30	28

7.0 Plant Noise

- 7.0.1 As the plant details are unknown at this stage of the scheme, plant design and selections shall be informed by the noise limits proposed within this report and where appropriate, consider what additional mitigation may be necessary. Since the proposed development includes a café, after-school buildings and the performing arts studio, any plant noise that is introduced to the scheme will result in daytime hours being more likely to be more prominent than the night-time levels.
- 7.0.2 The potential mitigation measures should ensure that:
- Plant noise from mechanical equipment is designed and installed to control noise such that it does not exceed NR 45 at 1 m from the façade of any residential property;
 - Rating level of the proposed plant at 1 m outside of habitable room windows of the nearest residential properties should not exceed the background sound levels by more than 5 dB.
- 7.0.3 NR 45 equates to approximately 51 dB LA , which has to be achieved at 1 m from the façades of all identified residential NSRs. Assuming no character correction, the rating level will be equal to the specific sound level from any proposed plant. The levels should not exceed the background by more than 5 dB in order to be acceptable with low impact on the occupants

7.1 Nursery/After School Rooms

- 7.1.1 Acoustics of Schools: a design guide, Reference 12, states that it is possible to achieve IANL inside schools on sites with external noise levels as high as 70 dB $L_{Aeq,30min}$ with suitable considerations of building envelope sound insulation or screening. The maximum external noise level incident on the façades of the school building is 46 dB $L_{Aeq,15min}$ as per the measured noise levels shown in section 4.2. Closed windows allow a reduction of approximately 17 dB inside school rooms. It would hence be possible to achieve noise levels inside the school rooms within the IANL upper limits as shown in Table 2. Natural ventilation or hybrid strategy using openable windows will be a suitable ventilation strategy for the building.
- 7.1.2 The afterschool area is expected to house a maximum of 26 children ranging from 6months to 5yrs old. This will be open from 7.30am to 6.30pm. children will be contained internally and therefore noise breakout levels are expected to be minimal. Should the courtyard, or any other external area be used in the future, further considerations will need to be made as to the noise impact on surrounding NSRs.

7.2 Café Noise Levels

- 7.2.1 The final stage of the development assessment is to examine Patron noise. This is looking at the cafe area both at ground floor and first-floor levels. The DEFRA report on pubs and bars, as the closest reference data for this type of gathering area, stated that small crowds in a venue would be assumed to have a L_{Aeq} value of 65-70dB, based on approximately 30-50 people interacting at the same time, when speech is said to be elevated. This is compared to 'normal' speech levels of 55-60dBA. This figure can then be used to compare to the WHO guidelines for community noise to get a better

perspective on the likelihood of noise nuisance being generated at the nearest NSR locations.

- 7.2.2 Assuming the higher-end value is reached (70dbA L_{Aeq}), with the presence of the bar/serving area, this would account for each of the tables being filled, people talking 'loudly' and continuously and also cover more intermittent noise such as movement of the chairs etc. It would, however, be recommended that chairs used in the area are fitted with rubber tips on the feet, or the area has a soft furnishing floor if possible, to reduce the likelihood of high-level noise from the movement of chairs. Using something like fake grass or carpet for the seating area would also help with the noise impact for this aspect of the development.
- 7.2.3 It should be noted, however, that any regular shouting and rowdy members of the public should be immediately discouraged and, if necessary, ejected from the cafe to maintain the lack of adverse impact on the surrounding NSRs. It is not expected to be that kind of social area but noise levels should be a strict consideration for any staff present.
- 7.2.5 As the café area does not have any skylights the noise breakout to adjacent properties is expected to be minimal. There are no plans for anything other than 'ambient' music to be played in the café. This should not exceed the elevated speech levels mentioned in 7.2.2 as it would encourage more elevated speech from those inside the café and in turn increase the ambient noise level of the area. This should therefore be limited to a value of 70dBA at 1m from the speaker systems.
- 7.2.6 All breakout areas for the café are facing out towards King Street and therefore there are no direct line-of-sight NSR areas that need to be considered for this low-level noise source.
- 7.2.7 At present there are no plans for additional or modified kitchen appliances, extraction units or AC units to be present in the café. If these are introduced a further BS4142:2014 assessment may be required based on the placement of the external units or extraction vents.

8.0 Conclusion

- 8.0.1 The use of the suggested configuration specification in section 6 will allow the Performing Arts Studio area in particular to reduce the likelihood of any adverse impact on surrounding NSRs. It is noted that any windows in the area should not be open during performances as elevated levels of music would mean that NR rating levels would be exceeded at the surrounding NSR locations.
- 8.0.2 This report has discussed replacing the windows with double-glazing Rw29 or equivalent windows. If this is not possible from a conservation aspect the attenuation of the windows should be strengthened by an additional glazing panel internally. This should have an airgap of at least 30mm in order to provide the required level of attenuation for any break-out music from the site (min Rw25 total).
- 8.0.3 There are no external areas for the nursery/after-school club areas that need to be considered. If this is changed at any point in the future a further noise impact assessment may be required to make sure that the site still does not have any adverse impact on the surrounding NSR locations.
- 8.0.4 Opening hours and capacity of the Café area are not expected to provide any adverse impact on the surrounding area. This is based on any music played in the area being restricted to 'ambient' levels with a limit of 70dBA at 1m from any speaker. Such a limit will reduce the need for excessive noise levels from patrons in order to hold conversations and make sure that the overall ambient levels of the site are not at such a level where excessive breakout noise into the adjacent buildings would be expected.
- 8.0.5 All speaker systems should be installed on anti-vibration or isolation mounts to make sure that there is also not vibration transfer from music in any of the respective areas.

9.0 Credentials

Name	Title	Credentials
James Flitton BSc AMIOA	Acoustic Consultant	IOA Diploma in Acoustics & Noise Control
		Associate Member Institute of Acoustics
		CSCS Professionally Qualified person
		Affiliate Member of IDE
Signed		

Appendix A – Acoustic Terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20 \mu Pa$. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A-weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. Generally used to describe background noise level.

Appendix B - Noise Survey Instrumentation

Type	Manufacturer	Model	Serial Number	Last Cal	Cal Due
SLM	NTi	XL3-TA	A3A-01600-F0	13/03/2025	13/03/2027
Pre-amp	NTi	MA220	14814	13/03/2025	13/03/2027
Microphone	NTi	MC230A	14814	13/03/2025	13/03/2027
Calibrator	NTi	CAL2000	20850	21/07/2025	21/07/2026
SLM	NTi	XL3-TA	A3A-01594-F0	13/03/2025	13/03/2027
Pre-amp	NTi	MA220	14796	13/03/2025	13/03/2027
Microphone	NTi	MC230A	14796	13/03/2025	13/03/2027

Appendix C – Weather Conditions Chart Used

(Blank Version)

Weather Conditions				
Measurement Location	Date/Time	Description	Beginning of Survey	End of Survey
		Temperature:		
Cloud Cover Symbol Scale in oktas (eighths) 0 Sky completely clear 1 2 3 4 Sky half cloudy 5 6 7 8 Sky completely cloudy (9) Sky obstructed from view				

Appendix D – CadnaA Calculations

Receiver
Name: NSR 1
ID:
X: 31317245.71 m
Y: 5702282.47 m
Z: 9.00 m

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
3	31317237.06	5702262.87	5.68	0	DEN	32	13.6	4.5	0.0	3.0	0.0	37.7	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-13.6
3	31317237.06	5702262.87	5.68	0	DEN	63	28.8	4.5	0.0	3.0	0.0	37.7	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	1.6
3	31317237.06	5702262.87	5.68	0	DEN	125	42.9	4.5	0.0	3.0	0.0	37.7	0.0	-0.9	0.0	0.0	0.0	0.0	0.0	13.6
3	31317237.06	5702262.87	5.68	0	DEN	250	54.4	4.5	0.0	3.0	0.0	37.7	0.0	-1.4	0.0	0.0	0.0	0.0	0.0	25.6
3	31317237.06	5702262.87	5.68	0	DEN	500	61.8	4.5	0.0	3.0	0.0	37.7	0.0	-1.5	0.0	0.0	0.0	0.0	0.0	33.1
3	31317237.06	5702262.87	5.68	0	DEN	1000	65.0	4.5	0.0	3.0	0.0	37.7	0.1	-1.5	0.0	0.0	0.0	0.0	0.0	36.2
3	31317237.06	5702262.87	5.68	0	DEN	2000	61.2	4.5	0.0	3.0	0.0	37.7	0.2	-1.5	0.0	0.0	0.0	0.0	0.0	32.3
3	31317237.06	5702262.87	5.68	0	DEN	4000	60.0	4.5	0.0	3.0	0.0	37.7	0.7	-1.5	0.0	0.0	0.0	0.0	0.0	30.6
3	31317237.06	5702262.87	5.68	0	DEN	8000	53.9	4.5	0.0	3.0	0.0	37.7	2.5	-1.5	0.0	0.0	0.0	0.0	0.0	22.7
4	31317237.06	5702262.87	6.68	0	DEN	32	13.6	4.5	0.0	3.0	0.0	37.7	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	-13.6
4	31317237.06	5702262.87	6.68	0	DEN	63	28.8	4.5	0.0	3.0	0.0	37.7	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	1.6
4	31317237.06	5702262.87	6.68	0	DEN	125	42.9	4.5	0.0	3.0	0.0	37.7	0.0	-1.1	0.0	0.0	0.0	0.0	0.0	13.8
4	31317237.06	5702262.87	6.68	0	DEN	250	54.4	4.5	0.0	3.0	0.0	37.7	0.0	-1.5	0.0	0.0	0.0	0.0	0.0	25.7
4	31317237.06	5702262.87	6.68	0	DEN	500	61.8	4.5	0.0	3.0	0.0	37.7	0.0	-1.5	0.0	0.0	0.0	0.0	0.0	33.1
4	31317237.06	5702262.87	6.68	0	DEN	1000	65.0	4.5	0.0	3.0	0.0	37.7	0.1	-1.5	0.0	0.0	0.0	0.0	0.0	36.3
4	31317237.06	5702262.87	6.68	0	DEN	2000	61.2	4.5	0.0	3.0	0.0	37.7	0.2	-1.5	0.0	0.0	0.0	0.0	0.0	32.3
4	31317237.06	5702262.87	6.68	0	DEN	4000	60.0	4.5	0.0	3.0	0.0	37.7	0.7	-1.5	0.0	0.0	0.0	0.0	0.0	30.6
4	31317237.06	5702262.87	6.68	0	DEN	8000	53.9	4.5	0.0	3.0	0.0	37.7	2.5	-1.5	0.0	0.0	0.0	0.0	0.0	22.7

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
6	31317238.37	5702269.41	6.60	0	DEN	500	61.8	4.5	0.0	3.0	0.0	34.6	0.0	-1.5	0.0	0.0	1.5	0.0	0.0	34.7
8	31317238.37	5702269.41	5.60	0	DEN	500	61.8	4.5	0.0	3.0	0.0	34.7	0.0	-1.5	0.0	0.0	1.5	0.0	0.0	34.6

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB		(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)		dB(A)
9	31317237.53	5702265.24	6.64	0	DEN	500	61.8	0.2	0.0	3.0	0.0	36.7	0.0	-1.5	0.0	0.0	0.0	0.0	0.0	29.8
11	31317237.81	5702266.63	6.63	0	DEN	500	61.8	2.5	0.0	3.0	0.0	36.0	0.0	-1.5	0.0	0.0	1.5	0.0	0.0	31.2
12	31317237.53	5702265.24	5.64	0	DEN	500	61.8	0.2	0.0	3.0	0.0	36.7	0.0	-1.5	0.0	0.0	0.0	0.0	0.0	29.7
13	31317237.81	5702266.63	5.63	0	DEN	500	61.8	2.5	0.0	3.0	0.0	36.1	0.0	-1.5	0.0	0.0	1.5	0.0	0.0	31.2

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
15	31317227.89	5702271.12	6.64	0	DEN	500	61.8	2.8	0.0	3.0	0.0	37.5	0.0	-1.5	0.0	0.0	13.5	0.0	0.0	18.0
17	31317228.20	5702272.50	6.63	0	DEN	500	61.8	-0.4	0.0	3.0	0.0	37.1	0.0	-1.5	0.0	0.0	13.2	0.0	0.0	15.5
20	31317227.96	5702271.41	5.64	0	DEN	500	61.8	4.0	0.0	3.0	0.0	37.5	0.0	-1.5	0.0	0.0	15.2	0.0	0.0	17.5
22	31317228.26	5702272.79	5.63	0	DEN	500	61.8	-4.9	0.0	3.0	0.0	37.1	0.0	-1.5	0.0	0.0	14.7	0.0	0.0	9.5

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
24	31317227.25	5702268.19	5.66	0	DEN	500	61.8	4.5	0.0	3.0	0.0	38.4	0.0	-1.5	0.0	0.0	15.8	0.0	0.0	16.5
26	31317227.25	5702268.19	6.66	0	DEN	500	61.8	4.5	0.0	3.0	0.0	38.4	0.0	-1.5	0.0	0.0	13.9	0.0	0.0	18.5

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
30	31317226.52	5702264.87	6.70	0	DEN	500	61.8	4.5	0.0	3.0	0.0	39.3	0.1	-1.5	0.0	0.0	13.7	0.0	0.0	17.7
32	31317226.52	5702264.87	5.70	0	DEN	500	61.8	4.5	0.0	3.0	0.0	39.4	0.1	-1.5	0.0	0.0	16.0	0.0	0.0	15.4

Receiver
Name: NSR 2
ID:
X: 31317216.73 m
Y: 5702281.02 m
Z: 4.50 m

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Ref.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahaus	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB		(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
1	31317236.98	5702262.48	5.68	0	DEN	32	13.6	3.1	0.0	3.0	0.0	39.8	0.0	-3.0	0.0	0.0	9.0	0.0	0.0	-26.1
1	31317236.98	5702262.48	5.68	0	DEN	63	28.8	3.1	0.0	3.0	0.0	39.8	0.0	-3.0	0.0	0.0	11.4	0.0	0.0	-13.3
1	31317236.98	5702262.48	5.68	0	DEN	125	42.9	3.1	0.0	3.0	0.0	39.8	0.0	-0.3	0.0	0.0	12.7	0.0	0.0	-3.2
1	31317236.98	5702262.48	5.68	0	DEN	250	54.4	3.1	0.0	3.0	0.0	39.8	0.0	-1.1	0.0	0.0	17.0	0.0	0.0	4.7
1	31317236.98	5702262.48	5.68	0	DEN	500	61.8	3.1	0.0	3.0	0.0	39.8	0.1	-1.5	0.0	0.0	20.8	0.0	0.0	8.7
1	31317236.98	5702262.48	5.68	0	DEN	1000	65.0	3.1	0.0	3.0	0.0	39.8	0.1	-1.5	0.0	0.0	23.8	0.0	0.0	8.9
1	31317236.98	5702262.48	5.68	0	DEN	2000	61.2	3.1	0.0	3.0	0.0	39.8	0.3	-1.5	0.0	0.0	24.9	0.0	0.0	3.8
1	31317236.98	5702262.48	5.68	0	DEN	4000	60.0	3.1	0.0	3.0	0.0	39.8	0.9	-1.5	0.0	0.0	25.6	0.0	0.0	1.2
1	31317236.98	5702262.48	5.68	0	DEN	8000	53.9	3.1	0.0	3.0	0.0	39.8	3.2	-1.5	0.0	0.0	26.0	0.0	0.0	-7.6
2	31317237.26	5702263.86	5.67	0	DEN	32	13.6	-0.9	0.0	3.0	0.0	39.6	0.0	-3.0	0.0	0.0	8.9	0.0	0.0	-29.8
2	31317237.26	5702263.86	5.67	0	DEN	63	28.8	-0.9	0.0	3.0	0.0	39.6	0.0	-3.0	0.0	0.0	11.3	0.0	0.0	-17.0
2	31317237.26	5702263.86	5.67	0	DEN	125	42.9	-0.9	0.0	3.0	0.0	39.6	0.0	-0.3	0.0	0.0	12.6	0.0	0.0	-6.9
2	31317237.26	5702263.86	5.67	0	DEN	250	54.4	-0.9	0.0	3.0	0.0	39.6	0.0	-1.1	0.0	0.0	16.9	0.0	0.0	1.1
2	31317237.26	5702263.86	5.67	0	DEN	500	61.8	-0.9	0.0	3.0	0.0	39.6	0.1	-1.5	0.0	0.0	20.6	0.0	0.0	5.1
2	31317237.26	5702263.86	5.67	0	DEN	1000	65.0	-0.9	0.0	3.0	0.0	39.6	0.1	-1.5	0.0	0.0	23.6	0.0	0.0	5.3
2	31317237.26	5702263.86	5.67	0	DEN	2000	61.2	-0.9	0.0	3.0	0.0	39.6	0.3	-1.5	0.0	0.0	24.8	0.0	0.0	0.1
2	31317237.26	5702263.86	5.67	0	DEN	4000	60.0	-0.9	0.0	3.0	0.0	39.6	0.9	-1.5	0.0	0.0	25.6	0.0	0.0	-2.5
2	31317237.26	5702263.86	5.67	0	DEN	8000	53.9	-0.9	0.0	3.0	0.0	39.6	3.1	-1.5	0.0	0.0	26.0	0.0	0.0	-11.2
5	31317236.98	5702262.48	6.68	0	DEN	32	13.6	3.1	0.0	3.0	0.0	39.8	0.0	-3.0	0.0	0.0	9.9	0.0	0.0	-27.0
5	31317236.98	5702262.48	6.68	0	DEN	63	28.8	3.1	0.0	3.0	0.0	39.8	0.0	-3.0	0.0	0.0	11.5	0.0	0.0	-13.4
5	31317236.98	5702262.48	6.68	0	DEN	125	42.9	3.1	0.0	3.0	0.0	39.8	0.0	-0.4	0.0	0.0	11.6	0.0	0.0	-2.0
5	31317236.98	5702262.48	6.68	0	DEN	250	54.4	3.1	0.0	3.0	0.0	39.8	0.0	-1.2	0.0	0.0	16.2	0.0	0.0	5.6
5	31317236.98	5702262.48	6.68	0	DEN	500	61.8	3.1	0.0	3.0	0.0	39.8	0.1	-1.5	0.0	0.0	20.4	0.0	0.0	9.1
5	31317236.98	5702262.48	6.68	0	DEN	1000	65.0	3.1	0.0	3.0	0.0	39.8	0.1	-1.5	0.0	0.0	23.7	0.0	0.0	8.9
5	31317236.98	5702262.48	6.68	0	DEN	2000	61.2	3.1	0.0	3.0	0.0	39.8	0.3	-1.5	0.0	0.0	26.5	0.0	0.0	2.2
5	31317236.98	5702262.48	6.68	0	DEN	4000	60.0	3.1	0.0	3.0	0.0	39.8	0.9	-1.5	0.0	0.0	26.5	0.0	0.0	0.4
5	31317236.98	5702262.48	6.68	0	DEN	8000	53.9	3.1	0.0	3.0	0.0	39.8	3.2	-1.5	0.0	0.0	26.5	0.0	0.0	-8.1
7	31317237.26	5702263.86	6.67	0	DEN	32	13.6	-0.9	0.0	3.0	0.0	39.6	0.0	-3.0	0.0	0.0	8.0	0.0	0.0	-28.9
7	31317237.26	5702263.86	6.67	0	DEN	63	28.8	-0.9	0.0	3.0	0.0	39.6	0.0	-3.0	0.0	0.0	9.9	0.0	0.0	-15.7
7	31317237.26	5702263.86	6.67	0	DEN	125	42.9	-0.9	0.0	3.0	0.0	39.6	0.0	-0.5	0.0	0.0	10.7	0.0	0.0	-4.9
7	31317237.26	5702263.86	6.67	0	DEN	250	54.4	-0.9	0.0	3.0	0.0	39.6	0.0	-1.2	0.0	0.0	14.9	0.0	0.0	3.1
7	31317237.26	5702263.86	6.67	0	DEN	500	61.8	-0.9	0.0	3.0	0.0	39.6	0.1	-1.5	0.0	0.0	18.8	0.0	0.0	6.9

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahaus	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
7	31317237.26	5702263.86	6.67	0	DEN	1000	65.0	-0.9	0.0	3.0	0.0	39.6	0.1	-1.5	0.0	0.0	22.0	0.0	0.0	6.9
7	31317237.26	5702263.86	6.67	0	DEN	2000	61.2	-0.9	0.0	3.0	0.0	39.6	0.3	-1.5	0.0	0.0	24.8	0.0	0.0	0.1
7	31317237.26	5702263.86	6.67	0	DEN	4000	60.0	-0.9	0.0	3.0	0.0	39.6	0.9	-1.5	0.0	0.0	25.6	0.0	0.0	-2.5
7	31317237.26	5702263.86	6.67	0	DEN	8000	53.9	-0.9	0.0	3.0	0.0	39.6	3.1	-1.5	0.0	0.0	26.0	0.0	0.0	-11.3

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahaus	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
10	31317227.82	5702270.79	6.64	0	DEN	500	61.8	0.9	0.0	3.0	0.0	34.7	0.0	-1.5	0.0	0.0	1.5	0.0	0.0	31.0
14	31317228.12	5702272.17	6.63	0	DEN	500	61.8	2.0	0.0	3.0	0.0	34.3	0.0	-1.5	0.0	0.0	0.0	0.0	0.0	34.0
16	31317227.82	5702270.79	5.64	0	DEN	500	61.8	0.9	0.0	3.0	0.0	34.6	0.0	-1.5	0.0	0.0	1.5	0.0	0.0	31.1
18	31317228.12	5702272.17	5.63	0	DEN	500	61.8	2.0	0.0	3.0	0.0	34.2	0.0	-1.5	0.0	0.0	0.0	0.0	0.0	34.1

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahaus	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
19	31317227.25	5702268.19	6.66	0	DEN	500	61.8	4.5	0.0	3.0	0.0	35.5	0.0	-1.5	0.0	0.0	1.5	0.0	0.0	33.8
21	31317227.25	5702268.19	5.66	0	DEN	500	61.8	4.5	0.0	3.0	0.0	35.4	0.0	-1.5	0.0	0.0	1.5	0.0	0.0	33.9

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahaus	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
23	31317226.49	5702264.74	5.70	0	DEN	500	61.8	4.1	0.0	3.0	0.0	36.6	0.0	-1.5	0.0	0.0	5.6	0.0	0.0	28.2
27	31317226.80	5702266.12	5.69	0	DEN	500	61.8	-5.7	0.0	3.0	0.0	36.1	0.0	-1.5	0.0	0.0	4.1	0.0	0.0	20.4
29	31317226.49	5702264.74	6.70	0	DEN	500	61.8	4.1	0.0	3.0	0.0	36.6	0.0	-1.5	0.0	0.0	4.4	0.0	0.0	29.3
31	31317226.80	5702266.12	6.69	0	DEN	500	61.8	-5.7	0.0	3.0	0.0	36.2	0.0	-1.5	0.0	0.0	3.2	0.0	0.0	21.2

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahaus	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
41	31317238.31	5702269.09	6.60	0	DEN	500	61.8	3.4	0.0	3.0	0.0	38.9	0.0	-1.5	0.0	0.0	18.1	0.0	0.0	12.6
43	31317238.58	5702270.47	6.59	0	DEN	500	61.8	-1.8	0.0	3.0	0.0	38.7	0.0	-1.5	0.0	0.0	17.6	0.0	0.0	8.1
47	31317238.31	5702269.09	5.60	0	DEN	500	61.8	3.4	0.0	3.0	0.0	38.8	0.0	-1.5	0.0	0.0	19.4	0.0	0.0	11.3
49	31317238.58	5702270.47	5.59	0	DEN	500	61.8	-1.8	0.0	3.0	0.0	38.7	0.0	-1.5	0.0	0.0	18.8	0.0	0.0	6.9

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahaus	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
51	31317237.71	5702266.11	6.64	0	DEN	500	61.8	4.5	0.0	3.0	0.0	39.2	0.0	-1.5	0.0	0.0	18.6	0.0	0.0	12.9
52	31317237.71	5702266.11	5.64	0	DEN	500	61.8	4.5	0.0	3.0	0.0	39.2	0.0	-1.5	0.0	0.0	20.3	0.0	0.0	11.3

Receiver
Name: NSR 3
ID:
X: 31317202.50 m
Y: 5702270.93 m
Z: 6.50 m

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																			
Nr.	X	Y	Z	Ref.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
25	31317237.01	5702262.63	5.68	0	DEN	32	13.6	3.7	0.0	3.0	0.0	42.0	0.0	-3.0	0.0	0.0	5.5	0.0	0.0
25	31317237.01	5702262.63	5.68	0	DEN	63	28.8	3.7	0.0	3.0	0.0	42.0	0.0	-3.0	0.0	0.0	7.6	0.0	0.0
25	31317237.01	5702262.63	5.68	0	DEN	125	42.9	3.7	0.0	3.0	0.0	42.0	0.0	-0.2	0.0	0.0	9.6	0.0	0.0
25	31317237.01	5702262.63	5.68	0	DEN	250	54.4	3.7	0.0	3.0	0.0	42.0	0.0	-1.3	0.0	0.0	14.2	0.0	0.0
25	31317237.01	5702262.63	5.68	0	DEN	500	61.8	3.7	0.0	3.0	0.0	42.0	0.1	-1.5	0.0	0.0	18.3	0.0	0.0
25	31317237.01	5702262.63	5.68	0	DEN	1000	65.0	3.7	0.0	3.0	0.0	42.0	0.1	-1.5	0.0	0.0	21.8	0.0	0.0
25	31317237.01	5702262.63	5.68	0	DEN	2000	61.2	3.7	0.0	3.0	0.0	42.0	0.3	-1.5	0.0	0.0	23.7	0.0	0.0
25	31317237.01	5702262.63	5.68	0	DEN	4000	60.0	3.7	0.0	3.0	0.0	42.0	1.2	-1.5	0.0	0.0	24.9	0.0	0.0
25	31317237.01	5702262.63	5.68	0	DEN	8000	53.9	3.7	0.0	3.0	0.0	42.0	4.1	-1.5	0.0	0.0	25.6	0.0	0.0
28	31317237.29	5702264.01	5.67	0	DEN	32	13.6	-3.0	0.0	3.0	0.0	42.0	0.0	-3.0	0.0	0.0	6.4	0.0	0.0
28	31317237.29	5702264.01	5.67	0	DEN	63	28.8	-3.0	0.0	3.0	0.0	42.0	0.0	-3.0	0.0	0.0	8.8	0.0	0.0
28	31317237.29	5702264.01	5.67	0	DEN	125	42.9	-3.0	0.0	3.0	0.0	42.0	0.0	-0.2	0.0	0.0	10.7	0.0	0.0
28	31317237.29	5702264.01	5.67	0	DEN	250	54.4	-3.0	0.0	3.0	0.0	42.0	0.0	-1.3	0.0	0.0	15.5	0.0	0.0
28	31317237.29	5702264.01	5.67	0	DEN	500	61.8	-3.0	0.0	3.0	0.0	42.0	0.1	-1.5	0.0	0.0	19.7	0.0	0.0
28	31317237.29	5702264.01	5.67	0	DEN	1000	65.0	-3.0	0.0	3.0	0.0	42.0	0.1	-1.5	0.0	0.0	23.2	0.0	0.0
28	31317237.29	5702264.01	5.67	0	DEN	2000	61.2	-3.0	0.0	3.0	0.0	42.0	0.3	-1.5	0.0	0.0	24.7	0.0	0.0
28	31317237.29	5702264.01	5.67	0	DEN	4000	60.0	-3.0	0.0	3.0	0.0	42.0	1.2	-1.5	0.0	0.0	25.5	0.0	0.0
28	31317237.29	5702264.01	5.67	0	DEN	8000	53.9	-3.0	0.0	3.0	0.0	42.0	4.1	-1.5	0.0	0.0	26.0	0.0	0.0
35	31317237.01	5702262.63	6.68	0	DEN	32	13.6	3.7	0.0	3.0	0.0	42.0	0.0	-3.0	0.0	0.0	5.5	0.0	0.0
35	31317237.01	5702262.63	6.68	0	DEN	63	28.8	3.7	0.0	3.0	0.0	42.0	0.0	-3.0	0.0	0.0	7.2	0.0	0.0
35	31317237.01	5702262.63	6.68	0	DEN	125	42.9	3.7	0.0	3.0	0.0	42.0	0.0	-0.4	0.0	0.0	8.5	0.0	0.0
35	31317237.01	5702262.63	6.68	0	DEN	250	54.4	3.7	0.0	3.0	0.0	42.0	0.0	-1.4	0.0	0.0	13.0	0.0	0.0
35	31317237.01	5702262.63	6.68	0	DEN	500	61.8	3.7	0.0	3.0	0.0	42.0	0.1	-1.5	0.0	0.0	17.0	0.0	0.0
35	31317237.01	5702262.63	6.68	0	DEN	1000	65.0	3.7	0.0	3.0	0.0	42.0	0.1	-1.5	0.0	0.0	20.4	0.0	0.0
35	31317237.01	5702262.63	6.68	0	DEN	2000	61.2	3.7	0.0	3.0	0.0	42.0	0.3	-1.5	0.0	0.0	23.6	0.0	0.0
35	31317237.01	5702262.63	6.68	0	DEN	4000	60.0	3.7	0.0	3.0	0.0	42.0	1.2	-1.5	0.0	0.0	25.0	0.0	0.0
35	31317237.01	5702262.63	6.68	0	DEN	8000	53.9	3.7	0.0	3.0	0.0	42.0	4.1	-1.5	0.0	0.0	25.7	0.0	0.0
38	31317237.29	5702264.01	6.67	0	DEN	32	13.6	-3.0	0.0	3.0	0.0	42.0	0.0	-3.0	0.0	0.0	6.5	0.0	0.0
38	31317237.29	5702264.01	6.67	0	DEN	63	28.8	-3.0	0.0	3.0	0.0	42.0	0.0	-3.0	0.0	0.0	8.3	0.0	0.0
38	31317237.29	5702264.01	6.67	0	DEN	125	42.9	-3.0	0.0	3.0	0.0	42.0	0.0	-0.4	0.0	0.0	9.4	0.0	0.0
38	31317237.29	5702264.01	6.67	0	DEN	250	54.4	-3.0	0.0	3.0	0.0	42.0	0.0	-1.4	0.0	0.0	13.9	0.0	0.0
38	31317237.29	5702264.01	6.67	0	DEN	500	61.8	-3.0	0.0	3.0	0.0	42.0	0.1	-1.5	0.0	0.0	18.0	0.0	0.0

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB		(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
38	1317237.29	5702264.01	6.67	0	DEN	1000	65.0	-3.0	0.0	3.0	0.0	42.0	0.1	-1.5	0.0	0.0	21.4	0.0	0.0	2.9
38	1317237.29	5702264.01	6.67	0	DEN	2000	61.2	-3.0	0.0	3.0	0.0	42.0	0.3	-1.5	0.0	0.0	24.6	0.0	0.0	-4.2
38	1317237.29	5702264.01	6.67	0	DEN	4000	60.0	-3.0	0.0	3.0	0.0	42.0	1.2	-1.5	0.0	0.0	25.7	0.0	0.0	-7.4
38	1317237.29	5702264.01	6.67	0	DEN	8000	53.9	-3.0	0.0	3.0	0.0	42.0	4.1	-1.5	0.0	0.0	26.1	0.0	0.0	-16.8

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB	dB	dB		(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
40	1317226.49	5702264.71	5.70	0	DEN	500	61.8	4.0	0.0	3.0	0.0	38.9	0.0	-1.5	0.0	0.0	6.4	0.0	0.0	25.0
46	1317226.79	5702266.09	5.69	0	DEN	500	61.8	-4.9	0.0	3.0	0.0	38.9	0.0	-1.5	0.0	0.0	6.4	0.0	0.0	16.1
48	1317226.49	5702264.71	6.70	0	DEN	500	61.8	4.0	0.0	3.0	0.0	38.9	0.0	-1.5	0.0	0.0	2.9	0.0	0.0	28.5
50	1317226.79	5702266.09	6.69	0	DEN	500	61.8	-4.9	0.0	3.0	0.0	38.9	0.0	-1.5	0.0	0.0	3.1	0.0	0.0	19.4

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
53	1317227.25	5702268.19	5.66	0	DEN	500	61.8	4.5	0.0	3.0	0.0	38.9	0.0	-1.5	0.0	0.0	6.4	0.0	0.0	25.5
54	1317227.25	5702268.19	6.66	0	DEN	500	61.8	4.5	0.0	3.0	0.0	38.9	0.0	-1.5	0.0	0.0	3.6	0.0	0.0	28.3

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB		(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)		dB(A)
55	31317227.92	5702271.24	5.64	0	DEN	500	61.8	3.3	0.0	3.0	0.0	39.1	0.0	-1.5	0.0	0.0	6.4	0.0	0.0	24.1
56	31317228.22	5702272.62	5.63	0	DEN	500	61.8	-1.7	0.0	3.0	0.0	39.2	0.0	-1.5	0.0	0.0	6.4	0.0	0.0	19.0
58	31317227.92	5702271.24	6.64	0	DEN	500	61.8	3.3	0.0	3.0	0.0	39.1	0.0	-1.5	0.0	0.0	3.9	0.0	0.0	26.5
60	31317228.22	5702272.62	6.63	0	DEN	500	61.8	-1.7	0.0	3.0	0.0	39.2	0.0	-1.5	0.0	0.0	4.1	0.0	0.0	21.2

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
63	1317237.71	5702266.11	6.64	0	DEN	500	61.8	4.5	0.0	3.0	0.0	42.0	0.1	-1.5	0.0	0.0	18.6	0.0	0.0	10.1
66	1317237.71	5702266.11	5.64	0	DEN	500	61.8	4.5	0.0	3.0	0.0	42.0	0.1	-1.5	0.0	0.0	20.5	0.0	0.0	8.3

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
68	1317238.37	5702269.41	6.60	0	DEN	500	61.8	4.5	0.0	3.0	0.0	42.1	0.1	-1.5	0.0	0.0	18.5	0.0	0.0	10.1
70	1317238.37	5702269.41	5.60	0	DEN	500	61.8	4.5	0.0	3.0	0.0	42.1	0.1	-1.5	0.0	0.0	20.7	0.0	0.0	7.9

Receiver
Name: NSR 4
ID:
X: 31317264.90 m
Y: 5702251.89 m
Z: 4.50 m

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
33	31317237.06	5702262.87	5.68	0	DEN	32	13.6	4.5	0.0	3.0	0.0	40.5	0.0	-3.0	0.0	0.0	3.2	0.0	0.0	-19.6
33	31317237.06	5702262.87	5.68	0	DEN	63	28.8	4.5	0.0	3.0	0.0	40.5	0.0	-3.0	0.0	0.0	4.4	0.0	0.0	-5.6
33	31317237.06	5702262.87	5.68	0	DEN	125	42.9	4.5	0.0	3.0	0.0	40.5	0.0	-0.2	0.0	0.0	5.1	0.0	0.0	5.0
33	31317237.06	5702262.87	5.68	0	DEN	250	54.4	4.5	0.0	3.0	0.0	40.5	0.0	-1.1	0.0	0.0	7.8	0.0	0.0	14.6
33	31317237.06	5702262.87	5.68	0	DEN	500	61.8	4.5	0.0	3.0	0.0	40.5	0.1	-1.5	0.0	0.0	10.6	0.0	0.0	19.6
33	31317237.06	5702262.87	5.68	0	DEN	1000	65.0	4.5	0.0	3.0	0.0	40.5	0.1	-1.5	0.0	0.0	13.4	0.0	0.0	20.0
33	31317237.06	5702262.87	5.68	0	DEN	2000	61.2	4.5	0.0	3.0	0.0	40.5	0.3	-1.5	0.0	0.0	16.2	0.0	0.0	13.2
33	31317237.06	5702262.87	5.68	0	DEN	4000	60.0	4.5	0.0	3.0	0.0	40.5	1.0	-1.5	0.0	0.0	19.0	0.0	0.0	8.5
33	31317237.06	5702262.87	5.68	0	DEN	8000	53.9	4.5	0.0	3.0	0.0	40.5	3.5	-1.5	0.0	0.0	21.2	0.0	0.0	-2.3
34	31317237.06	5702262.87	6.68	0	DEN	32	13.6	4.5	0.0	3.0	0.0	40.5	0.0	-3.0	0.0	0.0	3.1	0.0	0.0	-19.5
34	31317237.06	5702262.87	6.68	0	DEN	63	28.8	4.5	0.0	3.0	0.0	40.5	0.0	-3.0	0.0	0.0	4.1	0.0	0.0	-5.3
34	31317237.06	5702262.87	6.68	0	DEN	125	42.9	4.5	0.0	3.0	0.0	40.5	0.0	-0.4	0.0	0.0	4.5	0.0	0.0	5.7
34	31317237.06	5702262.87	6.68	0	DEN	250	54.4	4.5	0.0	3.0	0.0	40.5	0.0	-1.2	0.0	0.0	7.1	0.0	0.0	15.4
34	31317237.06	5702262.87	6.68	0	DEN	500	61.8	4.5	0.0	3.0	0.0	40.5	0.1	-1.5	0.0	0.0	9.9	0.0	0.0	20.3
34	31317237.06	5702262.87	6.68	0	DEN	1000	65.0	4.5	0.0	3.0	0.0	40.5	0.1	-1.5	0.0	0.0	12.7	0.0	0.0	20.6
34	31317237.06	5702262.87	6.68	0	DEN	2000	61.2	4.5	0.0	3.0	0.0	40.5	0.3	-1.5	0.0	0.0	15.6	0.0	0.0	13.8
34	31317237.06	5702262.87	6.68	0	DEN	4000	60.0	4.5	0.0	3.0	0.0	40.5	1.0	-1.5	0.0	0.0	18.5	0.0	0.0	9.0
34	31317237.06	5702262.87	6.68	0	DEN	8000	53.9	4.5	0.0	3.0	0.0	40.5	3.5	-1.5	0.0	0.0	21.2	0.0	0.0	-2.4

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
36	31317237.71	5702266.11	5.64	0	DEN	500	61.8	4.5	0.0	3.0	0.0	40.7	0.1	-1.5	0.0	0.0	14.0	0.0	0.0	16.0
37	31317237.71	5702266.11	6.64	0	DEN	500	61.8	4.5	0.0	3.0	0.0	40.8	0.1	-1.5	0.0	0.0	12.8	0.0	0.0	17.2

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
39	31317238.37	5702269.41	5.60	0	DEN	500	61.8	4.5	0.0	3.0	0.0	41.1	0.1	-1.5	0.0	0.0	13.0	0.0	0.0	16.7
42	31317238.37	5702269.41	6.60	0	DEN	500	61.8	4.5	0.0	3.0	0.0	41.1	0.1	-1.5	0.0	0.0	12.1	0.0	0.0	17.6

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
44	31317226.34	5702264.03	5.70	0	DEN	500	61.8	0.5	0.0	3.0	0.0	43.1	0.1	-1.5	0.0	0.0	13.6	0.0	0.0	10.0
45	31317226.60	5702265.24	5.69	0	DEN	500	61.8	1.3	0.0	3.0	0.0	43.2	0.1	-1.5	0.0	0.0	16.6	0.0	0.0	7.8
57	31317226.79	5702266.07	5.69	0	DEN	500	61.8	-4.4	0.0	3.0	0.0	43.2	0.1	-1.5	0.0	0.0	17.6	0.0	0.0	1.0
59	31317226.34	5702264.03	6.70	0	DEN	500	61.8	0.5	0.0	3.0	0.0	43.1	0.1	-1.5	0.0	0.0	13.2	0.0	0.0	10.3
61	31317226.60	5702265.24	6.69	0	DEN	500	61.8	1.3	0.0	3.0	0.0	43.2	0.1	-1.5	0.0	0.0	15.9	0.0	0.0	8.4
62	31317226.79	5702266.07	6.69	0	DEN	500	61.8	-4.4	0.0	3.0	0.0	43.2	0.1	-1.5	0.0	0.0	16.8	0.0	0.0	1.8

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
64	31317227.25	5702268.19	5.66	0	DEN	500	61.8	4.5	0.0	3.0	0.0	43.3	0.1	-1.5	0.0	0.0	19.1	0.0	0.0	8.4
65	31317227.25	5702268.19	6.66	0	DEN	500	61.8	4.5	0.0	3.0	0.0	43.3	0.1	-1.5	0.0	0.0	18.2	0.0	0.0	9.2

vert. Area Source, ISO 9613, Name: "Window Break-out", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
67	31317227.99	5702271.57	5.64	0	DEN	500	61.8	4.5	0.0	3.0	0.0	43.4	0.1	-1.5	0.0	0.0	20.0	0.0	0.0	7.3
69	31317227.99	5702271.57	6.64	0	DEN	500	61.8	4.5	0.0	3.0	0.0	43.4	0.1	-1.5	0.0	0.0	18.7	0.0	0.0	8.6